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UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY—Circular No. 108

FOOD NEEDS FOR 1919

PART OF AGRICULTURAL PROGRAM FOR THE PERIOD BEGINNING WITH THE AUTUMN OF 1918

FALL-SOWN WHEAT AND RYE

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SUGGESTED ACREAGE OF WINTER WHEAT AND RYE FOR FALL OF 1918.

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INCREASE SUGGESTED FOR WINTER WHEAT.

THE Department of Agriculture deems it highly desirable that the acreage sown to wheat this fall and next spring shall be sufficient to assure, if possible, a harvest acreage of wheat in 1919 as large as the acreage harvested this year. To assure such a harvest acreage in 1919, the farmers of the country are asked to sow to winter wheat this fall not less than 45,000,000 acres. If conditions are especially favorable in all the States, an area of approximately 47,500,000 acres can be sown. These recommendations for winter wheat represent increases of 7 per cent and 12 per cent for the country as a whole over the acreage sown last fall. The detailed acreages assigned to the several States, both minimum and maximum, are shown in the accompanying table, with the percentage of increase over the acreage sown last year in each State. In some States where a large increase of winter wheat acreage is suggested, it is planned to reduce correspondingly the spring-wheat acreage. Winter wheat is a safer crop and produces a larger yield per acre, so the exchange is desirable in sections where this is practicable. The unusual weather conditions of the last two years are responsible for the increased acreage of spring wheat sown in 1918 in some sections where winter wheat usually is more extensively grown.

In some sections, owing to poor soils or severe winter conditions, it may be desirable to grow rye instead of winter wheat. In such cases, where the total food production probably would be increased, it is expected rye will be substituted for wheat. This must depend upon local conditions, and the planting of rye in this manner as a substitution would be in addition to the rye acreage specifically recommended in this circular.

Acreage of winter wheat suggested for sowing in the fall of 1918, with data showing basis for the recommendations.

[000 omitted in acreage columns.]

State.	Acreage suggested, 1918.				Acreage sown, 1917.	Maximum acreage sown, 1913–1917.	
	Minimum.	Per cent of 1917 acreage.	Maximum.	Per cent of 1917 acreage.		Acreage.	Year.
New York	525	103	563	110	512	512	1917
New Jersey	101	102	104	105	99	99	1917
Pennsylvania	1,575	103	1,683	110	1,530	1,530	1917
Delaware	153	105	160	110	146	146	1917
Maryland	774	105	811	110	737	737	1917
Virginia	1,536	105	1,609	110	1,463	1,463	1917
West Virginia	373	105	390	110	355	355	1917
North Carolina	1,238	105	1,297	110	1,179	1,179	1917
South Carolina	283	105	297	110	270	270	1917
Georgia	449	105	514	120	428	428	1917
Ohio	2,340	109	2,500	117	2,145	2,145	1917
Indiana	2,920	110	3,100	117	2,645	2,820	1914
Illinois	2,934	113	3,200	123	2,602	2,934	1914
Michigan	941	100	941	100	941	963	1914
Wisconsin	112	100	112	100	112	112	1917
Minnesota	89	100	89	100	89	89	1917
Iowa	600	131	900	196	459	525	1914
Missouri	3,100	108	3,235	113	2,875	2,875	1917
South Dakota	182	111	182	111	164	182	1916
Nebraska	3,674	117	3,762	120	3,135	3,674	1914
Kansas	9,479	100	9,479	100	9,479	9,479	1917
Kentucky	1,047	110	1,142	120	952	968	1914
Tennessee	924	110	1,010	120	840	901	1914
Alabama	151	105	158	110	144	144	1917
Mississippi	40	110	45	125	36	36	1917
Texas	1,730	107	1,730	107	1,622	1,730	1915
Oklahoma	3,264	100	3,400	104	3,264	3,400	1916
Arkansas	302	105	317	110	288	288	1917
Montana	775	100	775	100	775	775	1917
Wyoming	88	105	92	110	84	84	1917
Colorado	485	105	508	110	462	462	1917
New Mexico	275	102	283	105	270	270	1917
Arizona	46	105	48	110	44	44	1917
Utah	256	105	275	113	244	256	1915
Nevada	5	100	10	200	5	23	1915
Idaho	377	125	405	134	302	405	1914
Washington	754	180	850	200	422	1,156	1914
Oregon	590	105	692	123	562	692	1914
California	513	105	538	110	489	489	1917
United States	45,000	107	47,206	112	42,170	44,640	......

NOTE.—States that have suffered from drought conditions are not asked to increase wheat acreage, but if generally favorable conditions obtain it is expected that increases will be shown in those States. In Michigan, Wisconsin, Minnesota, and South Dakota larger winter-wheat acreage is not suggested, because of heavy increases suggested for rye.

If 45,000,000 acres of winter wheat are sown this fall, we may expect a harvest of about 636,000,000 bushels, compared with an estimated yield of 557,000,000 bushels of winter wheat this year and the 1912–1916 average of 552,000,000 bushels; if the highly desirable area of 47,206,000 acres is sown a harvest of 667,000,000 bushels of winter wheat may be expected next year. This is based on a yield of 15.7 bushels, the 1908–1917 average, and an average abandonment of 10 per cent on account of winter kill.

MINIMUM ACREAGE SUGGESTED.

All but seven States are expected to increase their winter wheat acreages of last year, and these seven are expected to maintain last year's area. The State of Washington is asked for the largest percentage increase, namely, 80 per cent, or a total of 754,000 acres on the minimum basis. This increase is more apparent than real. The abnormally low acreage of winter wheat sown last fall, 332,000 acres less than in 1916, was due to unfavorable weather conditions. This deficiency in winter wheat was offset by a 28 per cent increase, or 378,000 acres, over last year in spring wheat, but winter wheat is a more certain crop and its acreage should be increased. For a like reason it is suggested that Idaho sow a 25 per cent increase in winter wheat on the minimum basis. In Oregon, where the acreage last fall was more nearly normal, the increase suggested on a minimum basis is only 5 per cent. The same is true in California, Arizona, Utah, Colorado, and Wyoming. Owing to the condition of drought in Montana no increase in winter wheat acreage is suggested.

Several States in the Corn Belt are urged to make relatively large increases, at least as follows: Iowa, 31 per cent; Nebraska, 17 per cent; Illinois, 13 per cent; South Dakota, 11 per cent; Indiana, 10 per cent; Ohio, 9 per cent; and Missouri, 8 per cent. Kansas, already the leading State in winter wheat acreage, sowed about 9½ million acres last fall. Owing to drought conditions it may not be feasible for this State and Oklahoma to increase their acreage this year.

In the Southern States of Kentucky, Tennessee, and Mississippi a 10 per cent increase is suggested, and in Texas 7 per cent. In most of the other Southern States a flat increase is asked of 5 per cent on the minimum basis.

Delaware is asked for a 5 per cent increase, while in New York and Pennsylvania a minimum increase of 3 per cent and in New Jersey 2 per cent is suggested.

MAXIMUM ACREAGE ASKED.

To attain the maximum acreage of winter wheat asked (47,206,000 acres), some large increases would be required. In Washington the increase asked is an even 100 per cent. As noted in the discussion of the minimum acreage, the increase is not large as compared with the usual acreage in Washington. Under similar conditions a 34 per cent increase is asked in Idaho. In Oregon a maximum increase of 23 per cent is asked, which brings the total to 692,000 acres, or the same area that was sown in 1914. In Montana an increase will be possible if conditions improve materially before seeding time. In the other States of the Rocky Mountain region, where much new land recently has been broken and made available for crops, maximum increases of 10 per cent are asked, except in Utah, where the increase asked is 13 per cent, and in New Mexico, where the increase is only 5 per cent.

In the Corn Belt States of Ohio, Indiana, Illinois, Iowa, Nebraska, Missouri, Kentucky, and Tennessee, an increase in the winter wheat acreage approximately equal to 5 per cent of the 1917 corn acreage in these States is recommended. These are considerable increases over the 1917 winter wheat acreages, ranging from 13 to 23 per cent in all cases except Iowa, where it is 96 per cent. In all these States, except Missouri and Kansas, however, the 1917 acreage of winter wheat was below the maximum in recent years. A sacrifice of as much as 5 per cent of the corn acreage in this region, or, better, the sacrifice of a smaller percentage of both corn and oats, can be made in favor of winter wheat without endangering desirable farm practice and crop rotations. Because of the enormous acreage already grown and because of prevailing drought in part of the State no increase in acreage is suggested in Kansas.

The practical doubling of the winter wheat acreage suggested as desirable in Iowa means an increase from only 459,000 acres sown in the fall of 1917 to 900,000 acres. This year, a large acreage of spring wheat was sown in the State. As winter wheat is a safer and better crop in at least two-thirds of Iowa, the sowing of wheat this fall should be increased very materially, partly at the expense of spring wheat next year. Already a campaign for a million acres in wheat has been started in Iowa.

Oklahoma, in spite of the dry weather and adverse conditions of last fall, sowed the second largest acreage of any winter-wheat State. An increase of 4 per cent for the State, or a total of 3,400,000 acres, is suggested if conditions are very favorable. Part of the corn acreage might be transferred to wheat.

On the maximum basis, a 5 per cent increase in winter wheat is suggested in New Jersey and 10 per cent in New York, Pennsylvania, Delaware, Maryland, and Virginia. Larger acreages might be recommended, but it is believed that rye may well be increased even more largely than asked in these States, if it proves possible to sow more of the cereal crops.

In the Cotton Belt, increases of 10 to 25 per cent are asked in the belief that these States should more nearly supply their own wheat needs. To some extent, this may replace cotton, if necessary. The acreage in this region is still comparatively small, although much more wheat than formerly is being grown.

SOW MORE ACRES TO RYE.

It is recommended that 6,592,000 acres of rye be sown in the United States this fall, an increase of 8 per cent over the acreage sown last year, which was the largest in the history of the country.

On the basis of the 10-year average yield of 16.1 bushels, the acreage recommended would produce about 100,000,000 bushels.

Plans for an increased acreage of rye are of necessity influenced by plans for the wheat crop. This is because the two crops come into immediate competition in their labor demands; because rye is unpopular in the best winter-wheat sections, owing to its tendency to volunteer and thus become mixed with wheat; and because where wheat can be grown successfully it often yields a greater profit than rye. On the other hand, rye can be sown safely in some sections where soil or climatic conditions make wheat growing uncertain. Rye succeeds on poorer soils and in colder climates than wheat, and where it has proved to be a safer crop it should be given the preference. As rye is being largely used as a substitute for wheat as a bread grain, the sowing of rye instead of wheat in sections where conditions are more favorable for rye will materially increase the total food production. Detailed suggestions for the rye acreage to be sown in the various States are found in the accompanying table.

Acreages of winter rye suggested for sowing in the fall of 1918, with data showing basis for the recommendations.

[000 omitted in acreage columns.]

State.	Acreage suggested, 1918.	Percentage of 1917 seeding.	Acreage, 1917.		Acreage sown.	
			Sown.	Suggested.	1916	Average 1911–1915.
Maine	1	...	...	1	...	...
New Hampshire	1	...	...	1	...	...
Vermont	2	200	1	2	1	1
Massachusetts	6	200	3	6	3	4
Rhode Island	1	...	...	1	...	...
Connecticut	16	178	9	16	8	8
New York	180	109	165	170	150	154
New Jersey	100	118	85	120	80	79
Pennsylvania	300	106	283	350	280	287
Delaware	2	200	1	2	1	1
Maryland	35	117	30	35	29	29
Virginia	100	101	99	110	96	84
West Virginia	28	117	24	28	23	20
North Carolina	91	100	91	67	86	73
South Carolina	25	119	21	50	20	5
Georgia	35	167	21	100	20	15
Ohio	105	100	105	84	100	102
Indiana	250	103	242	275	210	154
Illinois	57	100	57	75	52	52
Michigan	500	113	438	454	378	381
Wisconsin	550	116	473	535	446	440
Minnesota	500	111	452	460	430	335
Iowa	100	159	63	116	60	60
Missouri	38	100	38	40	35	25
North Dakota	2,345	100	2,345	1,036	1,066	354
South Dakota	600	123	486	350	360	173
Nebraska	254	100	254	250	225	177
Kansas	105	100	105	100	106	64
Kentucky	33	100	33	33	35	33
Tennessee	33	100	33	50	31	29
Alabama	16	178	9	16	8	6
Mississippi	10	...	...	...	...	...
Louisiana	8	...	...	8	...	...
Texas	10	500	2	2	2	2
Oklahoma	10	100	10	15	10	8

Acreages of winter rye suggested for sowing in the fall of 1918, with data showing basis for the recommendations—Continued.

[000 omitted in acreage columns.]

State.	Acreage suggested, 1918.	Percentage of 1917 seeding.	Acreage, 1917.		Acreage sown.	
			Sown.	Suggested.	1916	Average 1911–1915.
Arkansas	10	100	10	1	10	1
Montana	15	100	15	30	11	11
Wyoming	30	125	24	30	20	10
Colorado	30	100	30	30	30	28
Utah	6	100	16	12	15	13
Idaho	2	100	2	3	3	3
Washington	9	100	9	10	8	8
Oregon	35	100	35	45	32	28
California	8	....	....	12	....	11
United States	6,592	108	6,119	5,131	4,480	3,268

COMPARISON OF WHEAT AND RYE.

The greater part of the rye acreage quite properly is in the spring-wheat belt, where it supplements that crop. Winter wheat can not be grown safely to any considerable extent in the chief spring-wheat States—Minnesota, North Dakota, and South Dakota—but winter rye is a reasonably safe crop there. The sowing of a large acreage of rye in these States in the fall materially increases the total crop production, as it allows a better distribution of farm labor throughout the year. Rye is less subject to plant diseases than wheat, hence the growing of rye helps to insure the farmer against losses by rust. Rye matures early, and thus may escape drought, which often damages later crops. It is recommended, therefore, that the rye acreage in North Dakota be maintained and that the acreage in South Dakota and Minnesota be increased, the total increase in these two States being 162,000 acres.

As winter wheat is a very uncertain crop in some sections of Michigan and Wisconsin, no increase in wheat acreage is suggested in those States, but a 62,000-acre increase in rye is suggested in Michigan and a 77,000-acre increase in Wisconsin. Rye succeeds better than wheat on certain soils in New York and Pennsylvania and on sandy lands generally in the Atlantic Coast States and around the Great Lakes. A material increase in rye is recommended in New York, New Jersey, Pennsylvania, and Maryland, and in several of the Southern States. Increases of 15,000 acres each are suggested in New York and New Jersey, 17,000 acres in Pennsylvania, and 5,000 acres in Maryland.

Increases in rye acreage are not asked in the Corn Belt, with the exception of Iowa, as it is believed that in these States the production of wheat is fully as profitable and that the growing of both rye and winter wheat in the same locality is not generally desirable. The increase in rye in Iowa should occur in the northeastern part of the State, where winter wheat is somewhat uncertain and where rye may well replace spring wheat.

The extension of the rye acreage in the Intermountain and Pacific Northwest States would be likely to interfere materially with the growing of winter wheat, as rye volunteers abundantly in these sections and would soon become mixed with wheat. No increases in the rye acreage in these States, therefore, are suggested.

SUBSTITUTE WHEAT FOR SMALL PART OF OATS AND CORN ACREAGE.

The farmers of the United States responded patriotically to the appeal made by the Government for increased acreage last year. In 1918 the acreages devoted to the major crops were larger than ever before. It is entirely possible therefore to increase the wheat acreage to be harvested in 1919, yet devote a larger acreage than usual to such crops as corn and oats.

The greatest acreage ever planted to corn was in 1917, when 119,700,000 acres were devoted to the crop. The second largest acreage is this year, with 113,800,000 acres. The next largest was in 1912, with 107,000,000 acres. The oat area has been expanding steadily since 1914, being 38,400,000 acres in that year, compared with 44,500,000 this year. In general, the largest increase in wheat acreage should be made in those areas where wheat is known to grow and mature well, and where necessary machinery, labor, and fertilizer are available.

Unfavorable weather conditions last fall resulted in the necessary abandonment of a large acreage of wheat, but more favorable conditions this spring and throughout much of the growing season made it possible to forecast a harvest of 891,000,000 bushels of both winter and spring wheat in 1918, according to the preliminary estimates issued by the Department on July 9. This abundant harvest now in sight greatly relieves the anxiety that has been felt in regard to bread grains.

The supply of wheat in the warehouses and granaries of the Nation will be practically exhausted before the new crop arrives on the market in quantity, the usual carry-over being much smaller than normal. Although this country produced a small wheat crop in 1917, the total exports of wheat in excess of imports, including flour in terms of wheat, amounted to approximately 100,000,000 bushels for the fiscal year ending June 30, 1918. This is in comparison with 178,000,000 bushels exported in 1917, 236,000,000 in 1916, and 331,000,000 in 1915. It was possible to export wheat in large quantities in 1915 and 1916 only because of the large wheat crops of 1912, 1913, 1914, and 1915, which, of course, gave the United States an accumulation of stocks of this grain. Both the 1916 and the 1917 crops were smaller than any crop since 1911, and besides this there was a greater demand for seed wheat and an increasing population. Consequently the reserve supply or carry-over of wheat this year is practically exhausted and is the smallest on record.

Moreover, it must be borne in mind that the carry-over in all of the ten importing countries of Europe was practically exhausted this year before the new harvest; that the normal consumption requirements of the exporting countries are increasing with the growth of population instead of diminishing; that some losses in storage and in transit may be expected to continue; and that it is highly desirable that a surplus should be accumulated as insurance against partial crop failure next year. To provide for these additional requirements it is therefore extremely desirable that the maximum acreage of winter wheat recommended be planted by the farmers of the United States if conditions are favorable.

It is with these facts in mind—the needs of this country and the Allies, the ever changing conditions in production here and abroad, shipping problems, the use of major crops as substitutes for wheat, as well as the necessity for maintaining a prosperous agriculture—that the Department has recommended this increase in winter-wheat acreage. These recommendations on wheat and rye, the same as last year, will be followed by recommendations for spring-planted crops and live stock.

Fortunately, from the farmers' standpoint, under existing conditions greater and more widely distributed acreage of wheat than of any intensively cultivated crop can be grown with a given labor supply. In view of the importance of early preparation for fall wheat and rye, the Department calls the attention of farmers to certain features that should not be overlooked.

SEED SUPPLY.

Early attention should be given the important problem of the seed-wheat supply. The principal questions in connection with seed supply are that the variety shall be pure, well adapted to the locality, and the seed free from noxious weed seeds and not infected by destructive plant diseases.

Home-grown wheat should be used for seed wherever possible. The best seed to get is that of an adapted variety which has been grown continuously in the locality for some time, provided it is pure. The idea that varieties "run out" if grown long in one section is only an expression for the fact that they are allowed to become mixed and weedy and disease-infected. Changing the kind of wheat grown should be done only for the purpose of getting a proved better variety. It is often desirable to do this, provided it is proved beyond question that the new variety is better for that locality. So-called "new" varieties, extravagantly advertised at fancy prices, should be disregarded completely. The varieties recommended by the State experiment stations or other authorities for the several districts within a State or region are the ones which should be grown. In Kansas, for example, the Kanred, an improved strain of Crimean wheat, is commonly grown. The introduction of these hard red winter wheats into the Columbia Basin of Oregon and Washington and elsewhere in the Pacific Northwest has increased yield and quality of the wheat produced. Poorer varieties are being displaced rapidly.

The best way to be sure that the seed wheat is free from mixture with other varieties and also from weeds and diseases is to inspect the growing field. Each farmer should do this in his own fields and neighborhood. When his own variety is not well adapted or otherwise of good quality he should inspect fields of adapted varieties grown by some of his neighbors and arrange to obtain seed from them after thrashing. He then frequently can arrange to have special care given to this field at time of thrashing in order to prevent mixture. Such care is especially desirable this year, when the supply of seed wheat retained on the farms probably is smaller than ever before. If the best seed available is not free from weed seeds, the best possible cleaning should be given it.

Smuts and some other diseases of seed wheat can be prevented entirely by proper treatment. These treatments have been published widely and are available to all. The Department of Agriculture and State authorities are spending large sums of money in helping to eradicate smut. This preventable disease should not be permitted to take part of the wheat needed by ourselves and others. The treatments are simple and cheap. Treat for smut and sow clean seed.

Seeding with a drill always is advisable. In general, early seeding gives better results than late seeding. Where the Hessian fly occurs time of seeding should be in accordance with the best advice given on this subject for each section of the country.

PREPARATION OF THE SEED BED.

The early preparation of the seed bed is important. In general, it saves moisture, liberates nitrogen, and results in a firm seed bed by seeding time, thus increasing yields and distributing labor as well.

Early plowing.—In most of the sections producing winter wheat early plowing results in increased yields. This is especially important when wheat follows wheat continuously, but also is true when wheat follows a green-manure crop, or corn or other tilled crop, or summer fallow. The wheat land should have at least two months to settle after plowing and before sowing, so that, with the help of the rains, it may become firm and compact beneath. The upper portion should then be well worked, just before sowing, until it is fine, mellow, and a fit place for sowing wheat.

Weeds should be kept down after plowing by working the land as is necessary. Land that must be plowed late, in preparation for wheat, should be firmed and compacted with rollers and harrows. Harrowing or disking the stubble or furrowing with a lister soon after harvest is beneficial in some sections. In the latter case leveling the ridges preparatory to seeding requires less labor and often is more profitable than late plowing.

Cornfield treatment.—As much of the winter-wheat acreage follows corn, late preparation of the seed bed is made necessary by the late removal of the corn crop. To aid in the preparation of corn land unusual attention should be given this year to keeping the corn crop as free as possible from weeds. As soon as the crop is removed the land need only be disked to make an economical but ideal seed bed for wheat.

Treatment of fallow.—The usual care given to the summer fallow should be continued in the West. Where the very profitable early spring plowing was practiced its advantage should not be lost by allowing weeds to grow. The purpose of the fallow is to store moisture. Moisture is not saved on a weedy fallow. After harrowing, scattered weeds that appear late in the season should be destroyed by the weeder or, if very scattered, by the hoe. Keep a clod mulch if possible. It will blow less than a dust mulch and will save as much moisture. Work fallow only enough to break crusts and keep it free from weeds.

FERTILIZERS.

In the eastern half of the United States, and to some extent on the western coast, fertilizers are generally required for best results with wheat. Where fertilizers are known to be needed, reasonable applications should be made; so far as suitable, fertilizers are available at reasonable prices. A small application at the time of seeding often will return its cost many times over in the following crop. Such applications are especially needed where wheat follows corn.

Although not generally considered as a fertilizer, lime is of great benefit to wheat and usually will result in considerably increased yields, especially where used in connection with other fertilizing materials. It is, of course, recognized that stable manure is one of the best fertilizers for wheat growing. It is the best practice to apply this on land to be planted to corn or some other cultivated crop. Wheat is not so likely to winterkill on fertile land as on poor land.

In a word, it may be said that fertility of the soil should be assured for wheat by following the best practice of soil enrichment in each section of the country.

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